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THE SOVIET UKRAINE - ITS PEOPLE AND AGRICULTURE . . . . .

Louis G. Michael*

Ukraine is one of the most important agricultural regions of the Soviet Union. Although its area is only about 2 percent of the total area of the Soviet Union, Ukraine accounted in 1935 for nearly one-fifth of the Soviet acreage under crop. In that year the Ukraine planted more than two-thirds of the Soviet sugar beets, about one-third of the vegetables, barley, corn, and buckwheat, one-fourth of the melons and sunflowers, one-fifth of the forage and fodder, legumes, millet, and wheat, one-sixth of the hemp, potatoes, and rye, and one-tenth or less of the oats, cotton and flax. Wheat is the chief crop in the Ukraine in terms of acreage, followed by rye, oats, and barley. More than 90 percent of the farm families are engaged in large-scale collective agriculture.

The Constituent Soviet Socialist Republic of the Ukraine is situated in the southwest of the European part of the Soviet Union.[1] If superimposed on a map of North America so that the southern latitude of the Ukraine would coincide with that of Ashley, North Dakota, the northern latitude would be about that of Humboldt, Saskatchewan. From east to west, the breadth of the Ukraine is equivalent to a little more than the distance from Fargo, North Dakota, to Bozeman, Montana. This latitudinal comparison suggests the growing of wheat.

On the west, the Ukraine is bounded by Bessarabia (former Russian territory now a part of Rumania) and Poland; on the south, by the Black Sea, the Crimea, and the Sea of Azov; on the east, by the territory of the Don Cossacks called Rostov *Oblast*;[2] on the north, by Voronezh and Kursk of the Black Soil Region and the *Oblast* of Orel and the Constituent Soviet Socialist Republic of White Russia.[3]

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* Formerly American agricultural attaché at Belgrade, Yugoslavia.

[1] The word "Ukraine" means "border lands."

[2] A political division similar to a state.

[3] This Republic is inhabited by a Slavic race called White Russians as distinguished from the Great Russians who occupy most of Russia proper. The name is an ancient one and must not be confused with the Russian émigrés, who call themselves "White Russians" as opposed to the Bolsheviki or "Red Russians."

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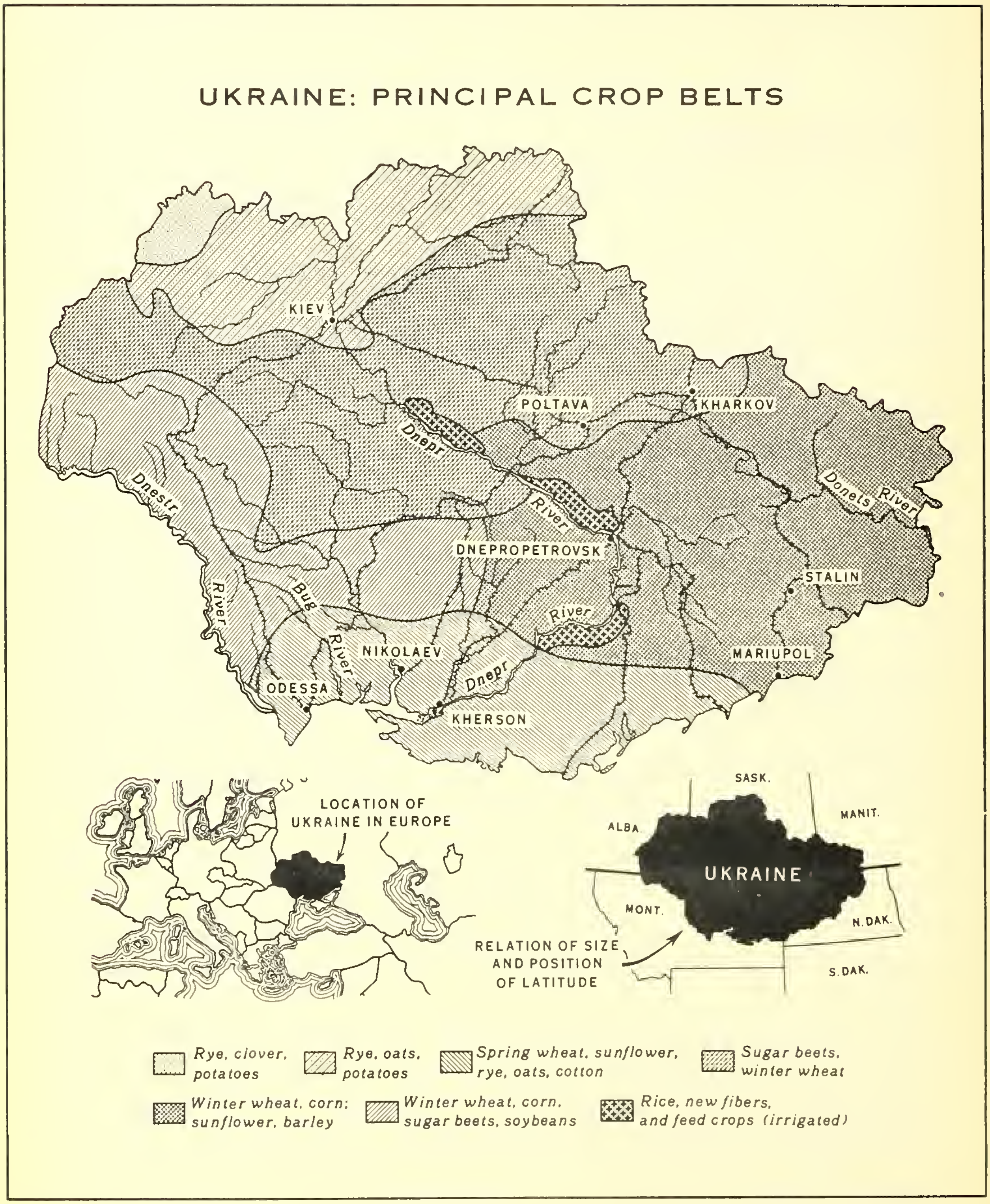
UKRAINE: PRINCIPAL CROP BELTS
KIEV
POLTAVA
KHARKOV
Dnepr
River
Dnestr
River
Donets River
DNEPROPETROVSK
STALIN
Bug
River
River
NIKOLAEV
ODESSA
Dnepr
KHERSON
MARIUPOL
LOCATION OF UKRAINE IN EUROPE
SASK.
ALBA.
MANIT.
UKRAINE
MONT.
N. DAK.
S. DAK.
RELATION OF SIZE AND POSITION OF LATITUDE
Rye, clover, potatoes
Rye, oats, potatoes
Spring wheat, sunflower, rye, oats, cotton
Sugar beets, winter wheat
Winter wheat, corn; sunflower, barley
Winter wheat, corn, sugar beets, soybeans
Rice, new fibers, and feed crops (irrigated)

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Fig. 1

In 1935, the total area of the Ukraine was placed at 172,000 square miles, or an area equivalent to that of North and South Dakota plus 16 percent of Montana.

The Ukraine is a land of many rivers. The navigable river Dnepr, rising in White Russia, flows some hundreds of miles in a southeasterly direction through the capital city of Kiev to Dnepropetrovsk, thence south through the locks of the dam of the great electric installation at Dneproges, thence southwest through the river port of Kherson, beyond which it empties into the Black Sea. The Southeastern Ukraine is drained by the Donets River which flows to the south and east and empties into the River Don. The upper catch basin of this river, known as the Donbas, is important because of its coal and iron deposits. West of the Dnepr is the partially navigable River Bug, emptying into the Black Sea some miles below Nikolaev, a grain port for seagoing steamers. And finally, along the western Bessarabian frontier, is the navigable Dnestr River. The Ukraine is thus favored with cheap transportation to bear her farm surpluses to the sea and thence to the consuming centers to the west. The Black and Azov Sea ports of Odessa, Nikolaev, Kherson, Berdyansk, and Mariupol were important shipping points before the World War, from which wheat and barley were exported to Western Europe.

SOIL TYPES AND CROP ZONES

In the United States, the forested areas of Wisconsin and the northeastern part of Minnesota grade into the tall-grass prairies of western Minnesota and the eastern Dakotas and on through the great plains to the short-grass prairies of the western States. A similar transition of zones is found in the Ukraine as one travels from the forests along the Polish frontier south and east to the treeless steppes along the shores of the Black Sea.[4]

The southern boundary of the forest zone of Europe passes through the northern part of the Ukraine. Annual rainfall in the northwest averages from 22 to 24 inches. This region is characterized by glacial sands and sandy loams similar to those of east-central Wisconsin, which favor growth of pines, aspens, birch, and oak. These Ukrainian forests are scattered and open, and grasslands are of frequent occurrence. Rye, oats, potatoes, hemp, and forage are the chief farm products of this region.

Further to the southeast the scattered wooded areas are of oaks, elms, beeches, and maples. The country becomes more open, merging into typical grass steppes. Rainfall drops to 18 and 20 inches. There is a transition in soil types through the predominantly loamy and mellow gray forest soils with patches of dark meadow soils on open grassy areas to black earths developed on the deep deposits of the south Russian loesses.[5] The soil character of this region is roughly similar to that of southern Minnesota and northwestern Iowa. Farm lands are devoted to sugar beets, flax, hemp, soybeans, sunflowers,[6] winter and spring wheat, rye, oats, barley, corn, and forage.

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[4] The following is based on maps and data published in *Rastenievodstvo S.S.S.R.*, Moscow, 1933, with interpretations by specialists of the Bureau of Soils, United States Department of Agriculture.

[5] Typical Chernozems (black soils).

[6] This region can be used to grow crops that normally require more moisture and hence has been chosen for industrial crops. It is well known that natural conditions are not perfectly adapted to any of these crops and that cost of production will be greater than in an environment better adapted to them; but, since no more suitable area is available, this must be used (Marbut, C. F., "Agriculture in the United States and Russia," *Geographical Review*, October, 1931, Vol. XXI, No. 4, p. 611.

These two regions, roughly bounded on the southeast by a line drawn through Kharkov and Poltava to the Moldavian Republic, comprise nearly half of the area of the Ukraine. Throughout all of these two regions agriculture is relatively intensive. Dairying and other animal industry and vegetable growing are prevalent, particularly in the vicinity of large cities.

In the lower valley of the Dnepr[7] and south along the coasts of the Black and Azov Seas are patches of Chestnut soils and southern Chernozems similar to those found in southern Kansas, western Oklahoma and the "Panhandle." This is a region of arid to semiarid and treeless steppe with a yearly rainfall of only 10 or 12 inches. Agriculture is extensive, with winter wheat, barley, and sunflowers as the principal crops. In recent years, cotton growing has been introduced into this region, but yields are low and the quality is poor. Pastures are sparse in summer. Animal industry is of secondary importance, although attempts are being made to produce green forage and silage crops in the vicinities of large centers of population.

Between the southern treeless steppe and the northwestern humid steppe is a broad belt of rich and deep black soils,[8] some of the best agricultural soils of the world. This belt extends from Bessarabia on the west through the Ukraine and northeastward to beyond the Ural Mountains. No extensive areas of similar soils are found in the United States and probably not in any other part of the world. Rainfall ranges from 18 to 12 inches. Winter and spring wheat, corn, sunflowers, barley, vegetables, and forage crops characterize the agriculture of the Black Soil Belt comprising from 25 to 30 percent of the total area of the Republic.

The Black Soil Belt of the Ukraine and the southern treeless steppe constitutes the surplus wheat- and barley-producing zone in which a large percentage of the Soviet Union's export cereals originate. The agriculture of the northwestern half of the Republic is organized to supply local-consumption demands or to ship foodstuffs north into the so-called deficit regions.

In the drainage basin of the Donets River in the eastern part of the Ukraine occurs the Donets Ridge region, surrounded by semiarid steppes. On the table-like summits of these mountains is a zone of relatively humid steppe. Isolated patches of deciduous forest are scattered through this region, mostly in the relatively lower areas and usually on light sandy soils.

In this region of the Ukraine the population is largely engaged in coal mining and the iron and steel industry. Agriculture is subordinated to the coal and metallurgical industries and is largely planned to serve local demands for bread, vegetables, dairy products, etc.

CLIMATIC CONDITIONS

The general crop zones in the Ukraine, as we have just seen, are roughly associated with belts of rainfall, which diminishes rapidly from the northwest to the southeast. The year-to-year crop production within these rainfall belts is determined largely by the distribution of precipitation throughout the year and is particularly influenced by the rains during May, June, and July. During these few months, the average rainfall in the northwestern third of the Republic averages 7 or 8 inches; whereas along the Azov-Black Sea littoral the average is about 5.6 inches. But occasionally in the southeastern part of the Ukraine there is little or no rain of agricultural significance during these months. Farming in the Ukraine is characterized by a constant fight for moisture conservation, and field cultural operations must be based on the fullest utilization of fall precipitation, winter snows, and the retention for crop utilization of spring and early summer rains.[9]

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[7] In the immediate valley of the Dnepr are limited patches of the true Chernozems on alluvial terraces; but, on the whole and especially on the lower terraces, rather poor sandy soils predominate, and sandy areas here and there may extend many miles right or left of the river, particularly in its lower reaches.

[8] Chernozems.

The Ukraine, like the Dakotas, is exposed to a clear sweep of severe cold winds from the Arctic, which may cause winter temperatures along the northern latitudes of Kiev and Kharkov to drop as low as -22° F., though they seldom get below -4° F. along the parallel of Odessa on the Black Sea.[10] Although in certain sections the percentage of winter-kill is high, the southeastern two-thirds of the Ukraine is a winter-wheat region with average January temperatures ranging from 18° to 22° F. in the north to from 25° to 27° F. in the south.

A constant handicap to the farmers of the Ukraine is the cold, dry east wind, which menaces the moisture supply at the beginning of spring plowing in March. In summer, this east wind frequently sweeps in across the Caspian Sea from the blistering deserts of Central Asia, and noon temperatures may rise to 130° F. or more. Although mean July temperatures average from 66° F. in the north to 73° F. in the south, the hot, desiccating east winds may at any time create a summer drought varying in intensity from crop failure in the southeast to greatly reduced yields in the northwest.

The growing season, as limited by 55° F. early spring temperature and 54° F. fall temperature, ranges from 160 days in the southeast to 130 days in the northwest.

The conditions of soil and climate of the Ukraine have roughly determined the types of farming in different sections of the area, varying from intensive in the northwest to extensive in the southeast. Although historical developments, as we shall see, have played a leading role in concentrating the population in the northern districts of the Republic, nevertheless, just as it requires a larger acreage to support a family in eastern Montana than in western Minnesota, so we find the grain districts of southeastern Ukraine still sparsely populated and a much smaller acreage per family and consequently a denser population, about two-thirds of the total, in the northwest half of the Republic.

THE PEOPLE

The population of the Ukraine in 1927 was placed at about 29 million, of whom some 5 million were classified as city dwellers and 24 million as villagers. See table 1. During the next 6 years, the total population increased nearly 3 million, but there were only 500,000 or 600,000 more people living in villages in 1933 than in 1927. City dwellers had increased by more than 2 million, reaching 7,159,000 in

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[9] This is particularly important along the shores of the Black Sea, where a porous limestone lies near the surface and renders the retention of soil moisture particularly difficult

[10] Generally speaking, climatic conditions in southern Ukraine are modified by the proximity of the Black and Azov Seas.

1933 compared with about 5 million in 1927. There are no more recent official figures available, nor are there sufficient adequate data for making a reliable unofficial estimate. The 1933 estimate of 31,900,000 indicates a population density of about 185 per square mile, compared with about 9 per square mile in South Dakota.[11]

Table 1. Population numbers in the Ukraine, 1927, 1929, and 1933

CLASSIFICATION	1927 [a b]	1927 [b c]	1929 [c]	1933 [c]
	Thousands	*Thousands*	*Thousands*	*Thousands*
Urban	4,931.0	4,817.3	5,349.7	7,158.7
Rural	24,112.4	24,169.8	24,905.0	24,742.7
Total	29,043.4	28,987.1	30,254.7	31,901.4

[a] Total (resident and nonresident) population. For later years figures are available only for permanent (resident) population.

[b] Excluding urban districts not answering census requirements but erroneously included in the number of urban districts. Excluding urban population of towns that lost their urban status during the period 1926-1931 and including the population of towns that developed into such during the same period. Data published heretofore have been corrected accordingly, as a result of which above figures deviate from those published previously. Before these revisions were made, the distribution of urban and rural population was given as 5,373.6 and 23,669.8, respectively.

[c] Permanent (resident) population.

Statistical Yearbook of Ukraine, Kiev. 1935. Identical figures are given by the *Sotsialisticheskoe Stroiteljstvo S.S.S.R.*, Statistical yearbook, Moscow, 1934, from which footnote 2 was taken. 1927 figures are census data (December 17, 1926), while 1929 and 1933 data are official estimates as of the beginning of the respective year.

There are four relatively large cities in the Ukraine. Kiev, the present capital, had 560,000 inhabitants at the end of 1933; and Kharkov, another population center in the north, was reported at nearly 640,000. In the south, Odessa, the chief Black Sea port, was reported at 490,000; and Dnepropetrovsk, a river port and industrial center, at 360,000. In the mining and metallurgical *oblast* of Donets more than half (2,200,000) of the 4,100,000 population lived in mining and industrial centers and 1,900,000 in villages chiefly engaged in agriculture. Outside of the Donets.the inhabitants of the Ukraine are overwhelmingly agricultural. Some 82 percent lived in villages in 1933, compared with only 18 percent in cities.

Ethnological Distribution

According to a survey based on data for 1926,[12] 80 percent of the total population (29 million people) were classed as Ukrainians. Russians (9.2 percent), Jews (5.4 percent), Poles (1.6 percent), and Germans (1.4 percent) accounted for most of the remainder. In the smaller towns, villages, and rural settlements, the Ukrainians predominated heavily, accounting for nearly 85 percent of the population. In the 42 larger towns, known as district centers, however, Ukrainians accounted for less than 31 percent of the population, with Russians and Jews comprising 31.5 percent and 32.4 percent, respectively. There were a few Poles (2.3 percent) and Germans (0.7 percent), and 2.6 percent of the people were of other origins.

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[11] As of April 1931.

[12] More recent figures are not available.

Table 2. Population of the Ukraine, by ethnological groups, 1926

ETHNOLOGICAL GROUP	TOTAL		DISTRICT CENTERS		OTHER TOWNS AND VILLAGES	
	NUMBER	PERCENTAGE	NUMBER	PERCENTAGE	NUMBER	PERCENTAGE
	Thousands	*Percent*	*Thousands*	*Percent*	*Thousands*	*Percent*
Ukrainians	23,225.2	80.0	791.3	30.60	22,433.9	84.8
Russians	2,666.9	9.2	813.3	31.45	1,853.6	7.0
Jews	1,572.7	5.4	837.8	32.40	734.9	2.8
Poles	475.8	1.6	58.7	2.27	417.1	1.6
Germans	395.0	1.4	17.8	.69	377.2	1.4
Moldavians	244.3	.8	67.0	2.59	640.8	2.4
Bulgarians	91.1	.3				
Greeks	98.2	.3				
Foreigners	23.1	.1				
Unclassified ..	251.0	.9				
Total	29,043.3	100.0	2,585.9	100.00	26,457.5	100.0
Percent	100.0		8.9		91.1	

Total number from *Statistical Yearbook of Ukraine*, Kiev, 1935, p. 382. Total number in 42 administrative district centers and percentage of specified ethnic groups from *Ukraina Statistitchnii Shchorichnik* (Statistical Abstract of Ukraine), Kiev, 1926, p. 4. Numbers in each specified ethnic group calculated. Numbers in other towns and villages obtained by difference.

Ukrainian Racial Origins

The Ukrainians, that is, the dwellers in the "border lands," are racially of Slavic origin descended from clans of people that centuries ago drifted into the forests bordering the Dnepr River and thence spread out onto the lands they now occupy. Similar clans worked their way through the forests of the north into the drainage basin of the Volga. Still later other clans crept along river courses in canoes until checked by the vanguard that had already begun to settle. Perhaps it was all part of one extended migration. In any case, the peoples of the north and east became differentiated into the Great Russians. A small group in the western marshlands became the White Russians. Those on the border lands to the south of these two groups of Slavs were called Little Russians and later Ukrainians. These three branches of the Slavs are similar in racial characteristics and speech, though the language of the Ukrainians has been differentiated into something more distinct than a dialect by the isolation of this branch of the Russian people from the main body of the Slavs.

Similar to their kinsmen to the north, the Ukrainians were originally a forest people, who lived by hunting and traded with rosin, beeswax, furs, and slaves captured from neighboring clans. They checked their southern trek when they came to the grasslands, over which roamed Asiatic nomads with whom the Ukrainians were in constant conflict, much the same as our own early settlers of the western plains contested occupation of the land with the Indians. Sections of the grasslands were occupied gradually after the hunting and raiding clans began to settle down to an established agriculture. But only the most adventurous or most desperate ventured into the treeless steppe to found new homes in gulches and river bottoms.

When the Mongols and Tartars swept over the Russias in the thirteenth and fourteenth centuries, the Little Russians were driven back into their forest fastnesses in the northern part of present-day Ukraine. The treeless steppe and much of the grasslands were appropriated by the Tartars for grazing lands, over which these nomads wandered for hundreds of years. During some of this time, the southern border lands were under the domination of Poland and Lithuania; and up to the middle of the nineteenth century the Little Russian peasants in many localities were serfs of families whose names distinctly indicate their Polish or Lithuanian origin.

When in the eighteenth century, under Catherine the Great, Russia's victorious struggle against the Turks culminated in the subjugation of the Crimean Tartars, the bordering grasslands and treeless steppes were but thinly populated.

Catherine and her successors made sporadic attempts at the colonization of the steppe regions, known as New Russia. Favorites of the crown who had received vast grants of land sent colonies of their own serfs or serfs purchased from other nobles into the south lands to establish farming villages in order to render their holdings profitable. But the mass of the pioneers that settled New Russia was made up of Ukrainians seeking better conditions of life than could be found in the congested regions of the north. Catherine, who was herself a German princess by birth, conceived the idea of building up the agriculture of this region by planting colonies of German peasants throughout New Russia from the Rumanian frontier to the Donbas and thence northeastward to the Volga. These German villages (relatively few in number) were scattered among other farming villages inhabited by Ukrainians, Great Russians, Moldavians (Rumanians), Poles, Bulgars, or remnants of other peoples.[13] Today, there is only a smattering of other peoples in the farming districts of the Ukraine; the great bulk of the rural population, about 85 percent, speak the Ukrainian mother tongue.

Historical events have played an important part in determining the geographic distribution of the people of the Ukraine that has resulted in two-thirds of the population being crowded into the northwestern half of the country, where soil and climatic conditions have made possible a fairly intensive agriculture. It is probable that climate more than any other factor has restricted the third of the population living in the southeast largely to extensive grain farming. But all factors, human and historical as well as environmental, have combined to determine how the Ukrainians of the present day utilize their land.

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[13] In southeastern Europe, farming people live in villages in which practically all of the inhabitants are of a single racial group. There is little or no mixing of the peoples, no "melting pot" as in the United States. The lands of a village inhabited by Ukrainians may be contiguous on one hand to the lands of a village inhabited by Germans and on the other hand to the lands of a village inhabited by Bulgars or Great Russians. The villages have maintained throughout the generations their native tongue. They often have no means of communicating one with the other even if they so desired. As a rule they do not desire to speak to their neighbors, whom they view with all the native suspicion and jealousy that is the heritage of peasant conservatism.

MUCH FARMING AND LITTLE INDUSTRY

In 1935, the area of the Ukraine was reported at 171,800 square miles, only 2.1 percent of the total area of the Soviet Union. In that year, however, the Ukraine harvested crops on 63,535,000 acres, or 19.4 percent of the 328,092,000 acres harvested in the Union as a whole.

The Republic is outstandingly agricultural with industries only feebly developed.[14] Fully 149,300 square miles (see table 3), or 87 percent of the Ukraine, may be classified as potentially productive land. This includes forests covering about 13 percent. The only true forests are found in the extreme northwest. Towards the southeast the prehistoric forests in which the ancient Ukrainians used to find shelter have long since been largely cleared to make way for farms that today are interspersed with woodlands, swamps, and meadows.[15] The appearance of this region is similar to southern Wisconsin except that lakes are infrequent.

Table 3. Utilization of Land in the Ukraine, 1935[a]

UTILIZATION	AREA
	1,000 square miles
Total plow land	109.6
Vegetable gardens attached to farm homesteads	7.2
Vegetable gardens outside of farm homesteads	1.6
Orchards and vineyards attached to farm homesteads	0.8
Orchards and vineyards outside of farm homesteads	1.0
Meadows	7.2
Pastures	7.4
Other lands	1.4
Forests	13.1
Total above	149.3
Swamps	2.8
Roads, etc.	4.8
Land under water	1.8
Farm homesteads (nonproductive)	4.2
Urban and industrial sites and other nonproductive land	8.7
Total area	[b] 171.6

[a] As of January 1, 1935, according to the census taken by the Commissariat of Agriculture of Ukraine

[b] Added total. The published total converted to square miles is 171.8.

Statistical Yearbook of Ukraine, 1935.

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[14] Large-scale industry is of very minor importance in the Ukraine, having been reported to employ only 1,308,546 workers in 1936. The occupations and numbers engaged for part of these workers were specified as follows: machine building and metal working, 357,000; coal mining, 266,000; food industry, 178,000; ferrous-metal industry, 152,000; chemical industry, 50,000; needle industry, 32,000; crude-petroleum production and iron mining, 22,000; boot and shoe manufacturing, 14,000; electric generating stations, 13,000; lumbering, 12,000; printing, stationery, etc., 11,000; leather and fur industry, 6,000; woolen, linen, and cotton industries, 6,000; cement manufacturing, 4,000; paper making, 3,000. *Sotsialisticheskoe Stroiteljstvo S.S.S.R.*, Statistical Yearbook, 1936

[15] Swamps cover only 1.6 percent of the area of the Ukraine, meadows, 4.2 percent

Table 4. Utilization of cropland in the Ukraine, by categories of producers, 1935.

UTILIZATION	STATE FARMS	COLLECTIVE FARMS		INDEPENDENT (NONSOCIALIZED) FARMS	WORKERS' GARDENS		TOTAL	PERCENTAGE OF TOTAL AREA UNDER CROPS
		SOCIALIZED FIELDS	HOUSEHOLD PLOTS		IN VILLAGES	IN CITIES		
	1,000 acres	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*Per-cent*
Grain[a]	5,949.9	39,871.8	877.9	803.8	128.2	44.2	47,675.8	75.0
Industrial plants ...	536.4	5,040.1	74.4	47.4	10.4	1.5	5,710.2	9.0
Forage and fodder[b] ..	1,597.5	3,095.4	161.4	20.5	13.8	0.5	4,889.1	7.7
Potatoes	441.6	1,152.5	1,086.0	125.8	142.1	210.5	3,158.5	5.0
Vegetables and melons	330.9	706.0	782.3	64.5	111.4	105.8	2,100.9	3.3
Total area under crops ...	8,856.3	49,865.8	2,982.0	1,062.0	405.9	362.5	63,534.5	100.0
Plow lands not utilized or held fallow[c]	–	–	–	–	–	–	6,609.5	–
Garden and other lands not utilized[d]	–	–	–	–	–	–	5,632.0	–
Total area[e]	–	–	–	–	–	–	75,776.0	–

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[a] Cereals and legumes.

[b] Includes perennial grasses seeded in 1934.

[c] Difference between total plow land (table 1) and total area under crops (table 3).

[d] The total (footnote e) less 70,144,000 acres of plow land.

[e] Plow lands, plus farm homestead vegetable gardens, plus vegetable gardens outside of premises of farm homesteads (table 1). Total area under crops taken from *Posevnye Ploshtchadi S.S.S.R.* (Sown Area of U.S.S.R.), 1935.

The southeastern part of the country presents a monotony of seeded fields and fallow with sparsely grassed pastures on soils not well suited to field-crop production.[16] There are no fenced fields as in the United States; the croplands, dotted here and there with villages, stretch away to the horizon.

As indicated in table 3, the croplands (plow lands and gardens) were estimated at 118.4 square miles or 75,776,000 acres - or 69 percent of the Ukraine. Of this area. 63,535,000 acres were reported to have been under crops in 1935 (see table 4). and 12,241,000 acres were held fallow for winter-grain seeding or were not otherwise utilized.

Every peasant household in the Ukraine has a small garden plot attached to the homestead or located with other garden plots on the outskirts of the village. Potatoes, vegetables, melons. etc., are usually grown on these plots for the private use of the family, but often grain and forage crops are planted. Just as in other countries of Europe, factory workers and other urban dwellers of the Ukraine are encouraged to supplement their cash income with home-grown vegetables. Hundreds of small "workers' gardens" are found in the vicinity of most large cities. Usually the worker lives on or near his garden during the summer and sometimes throughout the year.

Orchards and vineyards are not extensive in the Ukraine. The winters in the northwest are too cold and the rainfall in the southeast is too sparse to favor extensive commercial orcharding. Wherever climatic conditions are favorable, peasants plant a few fruit trees and grape vines for their home use. Some of the collective farms and a few of the state farms have more nearly formal orchards; but, on the whole, these are largely of local importance. There is no commercial fruit industry in the Ukraine of national significance.

Grain the Most Important Crop

The Russian classification of "grain" includes cereals, beans, peas. and certain other legumes utilized primarily for food or feed. Grain crops, which are grown everywhere in the Ukraine, occupied 75 percent of the total area under crops in 1935. Wheat, barley, corn, and other cereals totaled 45,393,000 acres against 2,283,000 acres under legumes (see table 4). Individual grains are discussed in greater detail on page 303.

Industrial crops occupied 9 percent of the cropland, with sugar beets in the northwest and sunflowers in the southeast as the most important products.

Only 7.7 percent of the 1935 acreage was under forage and fodder crops, chiefly in the northwest. Silage crops and green fodder crops, however, are being popularized in the southeastern steppe regions.

The bulk of the potato acreage (5 percent of the total cropland) is found in the northwestern part of the Ukraine. Attempts are being made to increase potato acreage in the steppe regions, but the frequency of summer droughts renders the crop a precarious venture.

[16] About 3.1 percent of the area of the Ukraine is classified as pasture

The chief acreage of vegetables and melons is naturally found in private gardens of farming peasants and of village, factory, and city workers. Some of the collective farms and state farms near large population centers specialize in vegetable production for urban supply, but otherwise acreages are small. Only 3.3 percent of the seeded area was under these crops in 1935.

Groups of Producers

The Soviet Government recognizes four general groups of agricultural producers in the Ukraine (see table 4), of which by far the largest group is composed of collective farmers, who in 1935 cultivated on fields tilled collectively and in gardens worked privately some 52,847,800 acres, or 83.2 percent of the total area under crops in that year. Another 8,856,000 acres, or 13.5 percent, was harvested by so-called state farms. These are large farms operated with hired labor by the Government, by consumer cooperatives, or by some factory in the interest of its workers. A small area, 1,062,000 acres or 1.7 percent, was in small scattered farms operated by independent farmers who had refused to join collective groups. And, finally, 1.6 percent of the cropland was planted by village and city workers in private gardens.

Before discussing yields, production, and the relative importance of the Ukraine to the Soviet Union, let us briefly examine the development and significance of the farming systems employed in the Ukraine today, which are successors to the peasant farming and large-estate farming that were in vogue before the World War.

DEVELOPMENT OF THE AGRICULTURAL ENTERPRISE

The farm systems in practice in the northwestern part of the Ukraine at the time of the World War dated back to remote antiquity, whereas those of the southeast began to be developed about the time of Catherine the Great, during whose reign the Tartar vassals of the Turkish sultan were finally driven out of the grasslands and treeless steppes of southern Russia.

Catherine and her successors maintained control over vast tracts of land in the territories wrested from the Tartars. A relatively small part of these tracts were held as crown estates. Some land was given to the church. The bulk of the south lands was given to court favorites and individuals whom the Government desired to reward. These estates were either operated as farming enterprises under the direction of skilled managers (sometimes imported from Central or Western Europe) or rented on a crop-share basis to land-hungry peasants.

In spite of considerable migration of Ukrainians, Great Russians, Germans, and others to the southern steppes, there was never sufficient local population to till the soil adequately, and each year large operators had to depend upon seasonal labor shipped in from the northern congested regions, where the population was so dense that in many localities the land owned by the individual households of villagers was not sufficient to provide subsistence.

A Ukrainian Village

At the opening of the World War, a typical Ukrainian village was made up of a number of small houses or huts, scattered irregularly along unpaved, deeply rutted streets with the church as a general focal point.[17] Each hut stood at the side of a small homestead fenced off from its neighbors with brush, woven saplings, stone, or mud bricks. The enclosure contained a primitive outhouse or straw-roofed shelter for livestock, should the family be so fortunate as to possess any. In localities suitable for horticulture, a few fruit trees might be planted along the fence or scattered here and there in the enclosure. Adjoining most homesteads was a small garden plot. Occupying the more desirable locations in the village were one or more larger, well-built houses with sheet-iron or shingled roofs. These were the houses of the rich peasants (the *kulaki*),[18] the local police officer, the village priest, and, in the occasional village where there was a school, the teacher. Such houses had wooden floors - a mark of distinction. Dominating the village was the great house of the landlord, usually a noble,[19] surrounded by a park or garden, servants' quarters, stables, warehouses, and office buildings.

Near the village, on broken land or land not well suited to field-crop production, were the village commons or pastures on which the peasants grazed their cattle, horses, hogs, and geese.

The estate lands, often thousands of acres in extent, occupied the best soils surrounding the village on the level areas of plateau or valley. The *kulaki* were also in possession of relatively good farming lands with fields frequently large enough to be tilled by modern methods. The peasant holdings were often crowded onto hillsides or marginal soils.

In contrast to the estate lands, which were subdivided into broad fields suitable to the use of modern machinery, the peasant holdings consisted of long narrow strips often running up and down a hillside. A peasant seldom owned two contiguous strips. As a rule his small strips were scattered in various directions and at varying distances from the village. Much time was lost going from one strip to another. Many peasants owned no land and many more did not own enough land to produce sufficient food for their families. These landless and poor peasants were forced to work for the great landlords or for the rich peasants (the *kulaki*) or else to migrate each summer as seasonal laborers to the southern steppes. The peasant in many localities was intentionally held in an impoverished condition to facilitate his exploitation as cheap labor on the estate and *kulak* lands.

The masses of the peasants owned only the most primitive farm implements - a crude plow that could not turn a furrow, a brush drag, a few hand tools. Cows were

[17] In the northwest, peasant houses were constructed of logs or of wood, with shingled roofs. In the south, wherever limestone was near the surface, stone was used. In most localities, houses were constructed of sun-dried bricks made of earth and straw. The one- and two-room structures were thatched with reeds or straw. In the better homes the flooring was of wood, but usually hard-beaten earth floors had to suffice.

[18] During the years following the emancipation of the serfs, a few of the shrewder peasants had acquired the lands of their more improvident neighbors and developed into labor-employing farmers in competition with the great landlord who employed the masses of the villagers - the landless peasants and those who did not own land enough to produce sufficient to feed their families. These comparatively rich peasants were called *kulaki*. According to American standards, the economic status of the *kulaki* was low, although much higher than that of the average run of their peasant neighbors.

[19] These nobles and great landlords were often Polish or of some other race foreign to the peasants who farmed their lands.

often used for draft. Seeding was universally by hand, and harvesting was done with a scythe or sickle. Peasant grain was treaded out by animals as in Biblical times. Peasant field cultural methods were primitive, based on ancient custom and habit. Peasant yields were at the caprice of the weather. The methods employed on the estates sometimes left much to be desired but were often based on the most approved application of science to practice.

After the World War, the lands of the large estates were expropriated and the homes of the great landlords were destroyed. Some of the acreage in many villages was retained by the Government as state farms to be operated, much as the former large estates had been, with hired labor. But the bulk of the estate lands was subdivided into strips and distributed among the landless, poor, and middle-class peasants - the village proletariat. The masses of the peasants continued to cultivate their strips of land according to the ancient customs and habits that had been handed down from father to son for generations. They could not do otherwise because they had neither sufficient equipment nor the necessary knowledge to change their methods. The methods were poor, and unit yields continued to be low.

In the congested north of the Ukraine, even after the distribution of estate lands, the acreage operated by an average family was still too small to produce substantial surpluses after the needs of the household had been provided. In the south, much land lay idle because in many localities there was more land available to each household than the family could cultivate with its few primitive implements and inadequate number of draft animals. Throughout the southern steppe regions, most peasant families had access to as much land as they had the physical means of tilling.

At this time the material welfare of most of the households in the southern villages was probably somewhat better than it had been before the revolution. This was generally not so in the northern congested districts where the Government had also reserved portions of former estate lands in the vicinity of large cities to be operated as state farms to supply urban inhabitants with vegetables, meat, and milk. The *kulaki* and certain of the upper middle-class peasants were in a favorable position. But such estate lands as had been distributed to the former landless farm laborers, to the poor peasants, and to the lower middle-class peasants were often insufficient to supply them with the means of adequate subsistence. The result was a discontented element in thousands of farming villages.

During the twenties the Soviet Government had great difficulty in procuring from the Ukraine the grain and other surpluses required for feeding the urban and industrial populations and for materials needed in manufacture. The reasons for this deficiency were that (1) the poorer masses of the population of farming villages did not produce more than enough to feed themselves and often they were on short rations, and, (2) because of the high prices for manufactured goods and comparatively low prices paid by the Government for farm products, the peasants, and particularly the well-to-do among them, resorted to evasions of deliveries to the Government and engaged in bootlegging flour and other products.

On account of difficulties attending the procurements of grain and other products so urgently needed to feed city dwellers, industrial workers, and the army, the *kulaki* as a class and many of the upper-middle-class peasants fell into disfavor with the Government.[20] The latter finally decided to drive the *kulaki* out of the villages and to turn over the cultivation of all village lands to peasants organized into collective farming groups.

The village proletariat, even in the south, had looked with envious eyes upon the relatively more prosperous *kulaki*, who possessed better mechanical equipment and greater numbers of draft animals. Therefore, when the Government proposed to pool all landholdings, equipment, and livestock (that is, to socialize the means of production), the village proletariat in most farming communities were favorably disposed because, if for no other reason, they stood the chance of obtaining a greater share of the production of the village lands than had heretofore been possible to them.

The *kulaki* were driven out of the farming villages to shift for themselves, and most of the recalcitrant upper-class peasants were forced to abandon individual farming. The socialization of the means of production in the villages and the establishment of collective (as distinguished from individual) farming during the early thirties was attended by violence and often by bloodshed. The upper-class peasants were forced to pool their lands with those of the poorer peasants. Much as they resented giving up their lands, there was no physical means of withholding them from the village socialized pool. When it came to turning over their livestock to the common good, however, there was general rebellion. Large numbers of the well-to-do peasants slaughtered their own livestock and in some cases destroyed their farm implements. Curiously enough, many of the village proletariat, who had joined in forcing collectivization upon the community, likewise slaughtered the few animals they themselves possessed.

This wholesale slaughter of livestock dangerously reduced farm draft power, particularly in the thinly settled regions of extensive grain farming in the treeless steppe. Hundreds of thousands of acres went out of cultivation. The Government's answer to this challenge to the success of collectivization of farming was the mechanization of agriculture. Tractors, power plows, harrows, drags, seeders, and combines were poured into the Ukraine, particularly into the surplus grain belt of the southern districts.[21] These machines were not turned over to the peasants permanently by the central Government but were furnished temporarily to collective farms by Government-owned and -operated machine-tractor stations (M.T.S.) for use in the performance of certain farm operations on specified acreages, with prices to be paid for their use and other conditions rigidly set forth in contract form.[22] These stations, established at central points throughout the Ukraine, hastily trained collective farmers to operate tractors and combines and other machinery furnished to the farms on a contract basis at a certain, though varying, percentage of the crop per acre for the use of each machine.[23]

[20] The *kulaki*, although well-to-do in comparison with other Russian peasants, were quite poor when judged by American standards.

[21] Between the years 1930 and 1936 (end of year) the number of tractors placed at the disposition of collective farms in the Ukraine increased from 2,151 to 66,471. (*Agriculture of the Soviet Union*, 1935, pp. 677-678). On January 1, 1932, there were 16 combines in the Ukraine. By the end of December 1936, the number had increased to 15,155.

[22] There were 47 machine-tractor stations (M.T.S.) in the Ukraine in 1930. By the end of 1936, the number had increased to 923.

[23] The prices paid for use of tractors and combines include gasoline and oil.

The introduction of power machinery into Soviet farming necessitated the reorganization of the field system of collective farms. Each farm was surveyed and plotted.[24] The surface was divided into a few large fields, eliminating the former strip system of farming. Not all of these fields are tilled today by machinery furnished by the Government, because each farm owns collectively at least some implements and draft animals. Nor is Government machinery used for all operations on any one farm, because one farm may have more plows, more seeding machines, more harvesting machines, or more draft animals than another. Therefore, in dealing with any one farm, a machine-tractor station enters into contract to furnish machinery, gasoline, and oil for plowing a certain acreage, seeding another certain acreage, and harvesting still another certain acreage. Threshing is almost universally done with threshers furnished by the Government because by this means the Government is able to check accurately the barn production of each farm.

A collective-farm group performs as much of its work as possible with its own implements and draft animals. On some farms there is hilly land not suited to use of power machinery. Government-owned machinery is rented supplementally to perform those operations that cannot be performed with the farm's own socialized inventory.

At the time of establishing collective farming in the Ukraine, few if any of the peasants had had experience in large-scale farming other than that gained by working as laborers for the landlord-owner of the local large estate. The masses of the peasants had been accustomed to tilling their long, narrow strips of land with primitive implements, according to ancient peasant methods handed down by tradition. At the time of collectivization, the peasant collective groups were faced with the problem of operating power machinery on broad acres, according to methods prescribed by central authorities, with which they were not familiar.

To remedy this difficulty, the Moscow Government employed on its own account and attached to each machine-tractor station several agronomists to give technical direction to farm activities and to supervise the operation of each collective farm. In important regions there is now one Government agronomist to each one or two farms.[25] Such an agronomist employed by the Moscow Government attends each collective-farm meeting. He assists in formulating the farm-management plans. He aids in arranging the contract for obtaining machinery from the machine-tractor stations. He supervises all farm operations from preparation of the soil to warehousing of the product. As agent of the Government, he supervises the delivery of payments in kind for the use of Government machinery. He also supervises "required deliveries" of products to Government procurement agencies.[26] Some of the stations conduct extensive experiments to determine the best varieties and the best field cultural methods for local use.

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[24] A framed copy of the farm plot hangs in each farm administrative office.

[25] Of the 782 machine-tractor stations in the Ukraine in 1935, 328 employed agronomists specializing in sugar-beet production. Some 282 stations specialized in grain, 95 in oilseeds, 42 in flax, and 35 in cotton.

[26] The central Government in addition to money taxes requires the delivery to Government procurement agencies of a certain quantity of grain, flax, potatoes, etc., per acre, a certain quantity of milk per cow, or wool per sheep, or meat per hog. For these products the Government pays a nominal price, which is much lower than the so-called market price at which its agents purchase farm surpluses. Not only are "required deliveries" turned over to the Government by collective farms as socialized groups of producers, but each peasant household is required to deliver to the Government a certain quantity of standard quality of the products grown on each individual garden plot.

The 923 machine-tractor stations scattered throughout the Ukraine had a profound influence upon the organization and development of the collective farms to which they furnished machinery in 1936.[27] Although the stations are open to improvement as to equipment and personnel, nevertheless the system as a whole has made progress in introducing new methods of agriculture into the Ukraine and toward transforming the primitive farming practices of Ukrainian peasants into a near approach to modern agriculture.

It is largely due to the intimate relation of these stations to the daily life of the farming peasant that the central Government is able to control acreages, fertilizers, field cultural methods, seed material, harvesting, and to a certain extent disposition of the production.

A Typical Collective Farm

Collective farms in the Ukraine differ greatly in size, number of workers, and specialization in crop production and animal husbandry. Official reports as of the end of the year 1936 indicate that, on an average, each of the 923 machine-tractor stations in the Ukraine serviced 29.7 collective farms, averaging 1,954 acres seeded per farm. On an average, each of the 27,433 collective farms of the Ukraine were operated by 136 families, indicating 16.2 acres of crops per family. In Vinitza, one of the congested northwestern districts, reported averages show that 214 households seeded 1,967 acres in 1936, or 9.2 acres of cropland per family: whereas, in Donets *Oblast* in southeastern Ukraine, 86 families seeded 2,500 acres in 1936, or 29.1 acres of cropland (almost exclusively grain) per family.

Although farms vary widely in acreage and type of husbandry, the general scheme of organization and operation is much the same. The following description of Shevchenko collective farm visited in 1938 will serve to give a sketchy view of what a better type of collective farm in the Ukraine is like and how it operates.

Shevchenko collective farm, operated by the inhabitants of the village of Muzitch, lies 19 miles southwest of Kiev, the capital of the Ukraine. As one approaches the village across a broad plateau, passing through large fields of grain and alfalfa belonging to the farm, it is difficult to see the houses of the community because Muzitch is a "hidden village." There are scores of such villages in southern Russia, built originally in eroded gorges in ancient days to conceal them better from roving bands of nomads and also to make them nearer the ground-water level.

A rough dirt road, dipping down into the draw, rambles here and there among the 374 homes of the villagers scattered irregularly on the hillsides. The one- or two-roomed straw-thatched houses, standing in small yards, are built of sun-dried bricks made of earth and straw. At the back of each house is a small garden of an acre or an acre and a half. Fruit trees are dotted here and there about the homestead. There is usually a primitive shed for a cow and small hovel-like structures for pigs and chickens.

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[27] At the end of 1936, there were 27,433 collective farms reported in the Ukraine; of this number M.T.S. partially serviced 25,510 farms.

The office of the president and the bookkeepers is in a building better than the general run of huts. It was formerly the home of a *kulak*. The home of the great landlord was destroyed years ago, as was also the church. Among the huts stands a large, well-lighted, two-story, modern-appearing schoolhouse, built of cream-colored brick to accommodate 300 or 400 children for a course of 7 years.

Although the houses in which the workers live are of the primitive pre-war type, the barns for housing the collective herds of horses and cattle are well-built of fire-burned brick with roofs of a slate-like composition. The floors are concrete, and the stalls and mangers are of fairly modern type.

A narrow stream meanders through the village. This has been dammed to form a large fishpond stocked with carp. Hundreds of ducks and geese are in evidence. A second, larger dam is under construction.

The village lands comprise 4,942 acres, of which 3,922 acres of plow land stretches away across the plateau in all directions from the village. In the bottom lands along the creek are extensive meadows for hay. The poorer rolling lands are utilized as pastures for the 275 head of cattle owned collectively and some 400 or more cattle owned privately by the villagers.[28]

East of the pasture lands are 270 acres of young orchard not yet in bearing. The farm operates a commercial nursery of some 125 acres, from which it supplies young stock to other collective farms.[29] This nursery is in charge of a horticulturist employed by the farm.

Shevchenko farm is devoted to diversified farming with grain, potatoes, vegetables, and milk (for sale in the city of Kiev) as its main commercial products.[30] Later fruit is expected to form an important item of income.

The working membership of this farm comprises 390 women and 310 men, of whom 30 are certified tractor drivers, two are combine operators, and two are chauffeurs.[31] There are three carpenters, a mechanic, a wagonwright, and several bookkeepers. One member is a graduate horticulturist in charge of the orchard and nursery, who acts as assistant to the president of the managing board.[32]

[28] In 1938, each household owned at least one cow as private property. The collective herd comprised 14 bulls, 75 cows, and 186 young stock. None of the villagers owned horses as private property. The collective horse herd comprised 170 work horses and 105 young stock. The farm owned collectively 150 sheep, 32 sows, and 168 pigs. Each household owned privately one or more pigs. All households owned chickens, ducks, and geese. There were no collective flocks.

[29] In the Kiev *Oblast*, there is one such collective farm nursery in each *raion* (county).

[30] A general idea of the relative importance of field crops may be gained from the following data for land utilization in 1938: Land seeded to wheat 712 acres, oats 524 acres, alfalfa 494 acres, potatoes 413 acres, rye 376 acres, barley 301 acres, vegetables 128 acres; fallow for winter crops 786 acres, other crops 188 acres; total plow land 3,922 acres; fruit trees 395 acres; other lands 625 acres. The total area of the collective farm is 4,942 acres, or 14.2 acres per family, which is nearly average for the Ukraine.

[31] The farm owns two trucks of 1.5 tons each.

[32] The president has held office for 9 consecutive years.

The ordinary farm workers are divided into brigades, each working under the direction of an appointed leader, called a brigadier, who has shown special ability in some particular field of work. The work of the farm is apportioned among various specialized brigades: field-crop production, vegetable growing, fruit raising, animal husbandry, etc. The members of these brigades choose the class of work in which they are interested and sign up for 1 year. The animal-husbandry brigades sign up for 2 years. A managing board, under the chairmanship of the president, is elected from among the brigadiers or other specialists. This board, under the control of one of the agronomists of the machine-tractor station, adopts the plan of work for the year and determines the acreage that is to be farmed with power machinery supplied by the Government.[33] Shevchenko farm performed more than half of its field work with its own horse-drawn machinery or by hand in 1938.

Certain fields are set aside to be plowed, harrowed, seeded, and harvested with Government machines operated by tractor drivers or combine operators who are members of the farm. Each of the other fields is divided up among the field-crop-production brigades. One brigade does not cultivate an entire field. Each field is subdivided into as many strips as there are brigades, and each brigade competes with every other brigade to obtain the highest production from its particular strip. Each brigade is split up into small groups called *zvenos* that work under the direction of a sort of straw-boss called a *zvenovod*. Each *zveno* operates on a measured substrip of one of the brigade strips into which the field has been divided. There is keen competition among the *zvenos* of each brigade. With certain crops, as potatoes, sugar beets, cotton, and corn, this competition is carried to the individual members of the *zveno*, to each of whom is assigned a certain number of rows for which he is responsible from planting time to harvest.[34]

Each farm operation has been reduced to terms of piece work based on the standard quantity of such work that should be performed in a given time. There are seven standard categories of piece-work jobs, with plowing of a certain area constituting a standard day's work to be paid for with a day-wage. In the lower category a girl watching geese for a day receives only a fraction of a day-wage, whereas a tractor driver working for the same period receives several day-wages.

Shevchenko farm has recently been doing a great deal of construction work, which has consumed a large share of the annual cash income, and the members therefore receive but little cash in payment for work. In 1937, the cash portion of a day-wage payment was 0.6 rubles.[35] Practically all of the day-wage consists of farm products, such as grain, vegetables, hay, straw, etc. When crops are good, this payment in kind results in a very considerable local consumption, because the peasant has no favorable means of disposing of the products he receives unless he happens to live in the vicinity of some large city.[36] It is true that Government agencies will purchase for cash any quantity of grain and certain other products that the peasant may have received in payment for work or may have produced on his own garden plot; but, compared with free-market prices or the prices that the Government charges consumers for such products or with the prices that the farmer must pay for consumer goods, the cash thus received by the peasant is small.[37]

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[33] The plan is based on the quota acreages, etc., assigned to this farm by the committee in charge of the fulfillment of the *raion* (county) plan; the county plan, in turn, is the county's quota of the provincial plan. The central Government at Moscow assigns to provincial organizations the part of the all-Union plan that each is to fulfill

[34] The explanation is given that the collectively cultivated fields are thus split up into strips because it facilitates competition for highest production per unit area among individuals, *zvenos*, and brigades. It is probable that the system (which is in a sense a reversion to the ancient peasant strip system of farming) was evolved to eliminate as far as possible the influence of differences in soils on the production obtained by the various *zvenos*.

[35] This is 60 kopeks, which at the official exchange rate of about $1.00 = 6 rubles is equivalent to 10 cents. If a peasant went to Kiev and bought a kilogram (2.2 pounds) of sausage, it would cost him 18 rubles, or all the cash he had received for 30 days' work. A man's three-piece suit of clothes retails at 53 rubles, or the cash receivable for 90 day's work. A kilogram of sugar costs around 10 rubles, or the cash for more than 16 day's work. Outside the sugar-beet districts, peasants seldom eat sugar but depend on honey for sweetening The same is true of the peasants of Hungary and other southeastern European countries.

State Farms

A state farm differs essentially from a collective farm in that the workers do not receive a share of the production but are paid a cash wage. The farm is operated by a staff of agronomists, mechanics, and other technicians under control of a managing director employed by the Government, a cooperative, or a factory. The state farms in the Ukraine have been organized on lands formerly part of some large estate. Their purpose is, chiefly, to furnish the Government with a ready supply of certain commodities. They are also designed to serve collective farms as examples of modern agricultural technique and as a source of purebred seeds and livestock. In 1935, some 776 state farms were reported to have seeded 8,856,000 acres, or 13.9 percent of the Ukrainian acreage under crops. (See table 4.)

In the vicinity of large population centers, groups of state farms may be operated under a centralized management, like the Kharkov Suburban Trust, which operates 24 state farms with some 125,000 acres under plow, scattered within a radius of 35 miles of the city of Kharkov. Each farm specializes in some commodity (vegetables, milk, butter, eggs, meat, etc.), which is delivered to a Government distributing agency to be passed on to consumers by retail stores.

Each state-farm director has a staff of plant and livestock specialists, mechanical engineers, sectional foremen, and common workers. Most of the latter are women, who receive smaller wages than men. Each farm carries its own inventory of tractors, combines, trucks, and other farm machinery; and in proportion to the acreage under crops state farms are in a much more favorable equipment position than are the collective farms. For example, at the beginning of 1935, the 776 state farms in the Ukraine inventoried 17,354 tractors and in that year had 8,856,300 acres under crops, or 510 acres per tractor, as contrasted with 41,132 tractors furnished by the machine-tractor stations to 22,114 farms operating collectively 49,865,800 acres, or 1,212 acres per tractor. As far as number of tractors and acreage under crops are concerned, in 1935 the state farms were more than twice as well equipped for speeding up farm operations and intensive cultivation as the collective farms. The technical staff of state farms is better trained and more broadly experienced than the agronomists and mechanics of the machine-tractor stations, which have expanded rapidly, so that most of the personnel is made up of young men and women recently graduated from agricultural colleges with only 1 or 2 years' practical work behind them.

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[36] Since the peasant cannot always sell the payments in kind he has received for his labor, he has fed as much as possible to his privately owned livestock. The number of animals held on peasant homesteads has thus tended to increase.

[37] A detailed discussion of this subject is outside the scope of the present article.

The state farms should thus be in a far better position to produce efficiently than the collective farms. Some state farms have attained the level of a high-class pre-war large estate, but these are exceptions. As a rule, the state-farm system has proved a disappointing experiment and an expensive investment for the central Government; and in recent years there has been a tendency to liquidate these farms wherever practicable and turn their lands over to adjoining collectives.

Independent Farms and Suburban Gardens

Scattered widely and thinly throughout the Ukraine are a few thousand peasants with sufficient independence of spirit to have resisted the collectivization movement, who, working under heavy taxation and other handicaps, have continued to farm their lands independently. In 1935, such farmers managed to seed 1,062,000 acres. This acreage was at that time only 1.7 percent of the total seeded area of the Ukraine. Since then, a steady campaign has been conducted against the independents, so that today they play an even less significant role in the production of farm surpluses.[38] As far as effect on the surplus production of the Ukraine is concerned, the influence of independent farming is negligible.

Although the fractional acreage of every vegetable, grain, or grass planted in each suburban garden is carefully recorded each year and forms part of the total for the Ukraine as a whole, and although each factory or other workman who plants a garden turns over to the Government a portion of the produce, nevertheless there were less than a million acres of such gardens under cultivation in 1935 and their production today is negligible as a source of supply to the Soviet Government.

EFFECTIVENESS OF LARGE-SCALE FARMING

There is little doubt that collective farming with power machinery is more efficient than the ancient village strip system of tillage. Few of the collective farms, however, or even the state farms in the Ukraine have attained the proficiency of a first-class pre-war large estate. Nevertheless, it may conservatively be said that under the system of collective and state mechanized farming in the Ukraine the potentialities of production are, on an average, somewhat greater than they were before the World War. That is to say, in good years the yields are probably somewhat higher and in poor years not quite so low as they would have been had the former system of large estates fringed with peasant-farmed strips of land remained in practice.

There is much room for improvement in the present set-up of agriculture in the Ukraine as regards field cultural methods, use of fertilizers, crop rotations, quality of seed, purity of livestock breeds - in fact all along the line.

At the present time, both collective and state farms are operating under heavy handicaps. Sudden and frequent changes in personnel in Provincial and district land-administrative offices, in machine-tractor stations, and even among the membership of the collective farms and the staffs of the state farms have had a detrimental effect on productive potentialities and have retarded progress.[39] Failure of the machine-tractor stations to fulfill contracts for delivery of tractors and other machinery to farms, as well as discontent with wage and other situations, has had a depressing effect on Ukrainian farmers that has been a distinct set-back to timely operations and effective work.

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[38] At the end of 1936, fully 95 percent of the peasant households of the Ukraine were members of collective farms, compared with 91 percent at the end of 1935.

These drawbacks have to a greater or less degree affected Soviet farming in all parts of Russia and are not confined solely to the Ukraine. Their effects, however, on the farm production of the Ukraine have often been of relatively greater significance to the national economy of the Soviet Union than similar handicaps to production in other parts of Russia because of the relatively large Ukrainian acreage under crops and consequently the large proportion of the total farm production of the Soviet Union that originates in the Ukraine.

CONTRIBUTION OF UKRAINE TO SOVIET AGRICULTURE

Principal Crops

Although the area of the Ukraine represents only 2.1 percent of the total area of the Soviet Union, nearly one-fifth of the Union's acreage under crops was found in the Republic in 1935. Compared with total acreages of specified commodities for the Soviet Union in 1935, the Ukraine planted more than two-thirds of the sugar beets, about one-third of the vegetables, barley, corn, and buckwheat, one-fourth of the melons and sunflowers, one-fifth of the forage and fodder, legumes, millet, and wheat, one-sixth of the hemp, potatoes, and rye, and one-tenth or less of the oats, cotton, and flax (see table below).

Table 5. Acreage in the Ukraine under specified crops and percentage relationship to total Soviet Union acreage, 1935

CROP	ACREAGE		PERCENTAGE IN UKRAINE	CROP	ACREAGE		PERCENTAGE IN UKRAINE
	UKRAINE	SOVIET UNION			UKRAINE	SOVIET UNION	
	1,000 acres	*1,000 acres*	*Percent*		*1,000 acres*	*1,000 acres*	*Percent*
Sugar beets..	[a] 2,227	[a] 3,217	69.2	Millet	2,612	13,613	19.2
Vegetables...	1,680	4,691	35.8	Wheat	17,060	91,566	18.6
Barley	7,547	21,604	34.9	Hemp	294	1,658	17.7
Corn	2,784	7,998	34.8	Potatoes	3,158	18,225	17.3
Buckwheat ...	1,702	5,181	32.9	Rye	9,044	57,007	15.9
Melons, etc..	421	1,637	25.7	Oats	4,533	45,269	10.0
Sunflowers ..	1,925	8,178	23.5	Cotton	387	4,827	8.0
Forage and fodder	932	4,125	22.6	Flax	341	5,758	5.9
Legumes	2,283	11,396	20.0	Others	676	3,787	17.9

[a] The harvested areas were 2,095,000 acres and 3,027,000, respectively.

Posevnye Ploshtchadi S.S.S.R. (Sown Area of U.S.S.R.), 1935.

[39] See "Effects of the Drought and Purge on the Agriculture of the Soviet Union," L. Volin, *Foreign Agriculture*, May 1939.

Grouping these crops according to the percentage relationship of their acreages does not exactly express their relative importance to the production economy of the Soviet Union, because the yields of certain products, wheat for example, average higher in the Ukraine than in the rest of the Soviet Union, whereas, on the other hand, the yield of cotton is relatively very low. Unfortunately, there are no reliable data available either as to actual barn production or as to the proportion of annual Government procurements that are consumed within the Ukraine - or even as to the actual amounts of the procurements. A general idea may be obtained, however, by comparing the published production figures of the Soviet Union and the Ukraine.[40]

Wheat - In 1931, the Ukraine is reported to have produced 237 million bushels of wheat, or 31.5 percent of the total for the Soviet Union, whereas the Ukrainian acreage was only 20.8 percent of the total. The year 1933 was exceptionally favorable, resulting in a reported 309-million-bushel production in the Ukraine, which was 30.3 percent of the 1,019 million bushels reported to have been produced in the entire Union.[41] In 1934, the biological wheat production of Russia was reported to have increased to 1,117 million bushels.[42] In that year the Ukraine suffered a severe drought, and wheat production fell to a reported 145 million bushels, or about 13 percent of the Russian total.

It is not possible to state with any great degree of certainty the relation of the wheat production of the Ukraine to that of the Soviet Union since 1932 because of the unreliability of the basic data, which are much higher than the results actually obtained. Based on Soviet figures, the average wheat production during the period 1931-1935 for the Union as a whole was 953 million bushels, compared with 229 million bushels attributed to the Ukraine, or 24 percent of the total. This is only an approximate figure. It is probable, however, that on an average during recent years the Ukraine has produced from 20 to 25 percent of the Russian wheat crop, although the year-to-year proportion may fluctuate widely. (See table 6.)

Other grains - As indicated in table 5, the barley, corn, and buckwheat grown in the Ukraine are relatively important to the national economy of the Soviet Union. In 1935, the Ukraine was reported to have produced 3,319,000 short tons of spring barley, which was 38.7 percent of Russia's total. Other important productions and percentages were, corn, 1.115,000 tons, or 36.6 percent, and, rye, 3.566.000 tons, or 15.3 percent. In the year 1931, the Ukraine's production of total grain (including legumes) reached 20,228,000 short tons, or 26.4 percent of the Soviet total. In 1934, a poor year, total grain production fell to 13,675.000 tons, or 13.8 percent of all grain produced in the Soviet Union. In 1935, the Ukraine produced 19.6 percent of Russia's total grain, or 19.465.000 tons of the total 99,362,000 tons.

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[40] Published production statistics of the Soviet Union beginning with 1933 are based on estimates made on the condition of standing grain and not on actual threshing results. This so-called biological production should be discounted from 10 to 20 percent for harvesting and other losses to obtain barn yields.

[41] This 1933 estimate is for biological production and is exaggerated. Harvesting losses in that year were officially reported as unusually heavy, but the Soviet Government has not revised the figures.

[42] This is a distorted figure largely because of an exaggerated estimate of the spring-wheat production of certain Asiatic districts.

Table 6. Acreage, yield, and production of wheat in the Soviet Union compared with those in the Ukraine, 1931-1935

YEAR AND REGION	ACREAGE			YIELD			PRODUCTION		
	WINTER	SPRING	TOTAL	WINTER	SPRING	TOTAL	WINTER	SPRING	TOTAL
Soviet Union	*1,000 acres*	*1,000 acres*	*1,000 acres*	*Bushels*	*Bushels*	*Bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
1931	27,970	63,140	91,110	13.5	5.9	8.3	377,886	375,330	753,216
1932	29,194	56,065	85,259	11.0	7.6	8.7	319,836	424,203	744,039
1933	26,703	55,435	82,138	16.1	10.6	12.4	429,809	588,966	1,018,775
1934	26,659	60,436	87,095	11.8	13.3	12.8	314,986	802,504	1,117,490
1935	30,782	60,784	91,566	14.3	11.4	12.4	439,322	693,468	1,132,790
Average 1931-1935 ..	28,262	59,172	87,434	[a]	[a]	[a]	[a]	[a]	[a]
Ukraine									
1931	13,173	5,799	18,972	14.6	7.8	12.5	192,219	45,059	237,278
1932	14,192	2,978	17,170	12.7	8.6	12.0	180,372	25,562	205,934
1933	13,482	3,032	16,514	19.5	15.3	18.7	262,796	46,241	309,037
1934	12,407	3,655	16,062	9.5	8.5	9.0	114,000	30,982	144,982
1935	14,056	3,004	17,060	15.1	11.7	14.5	212,310	35,109	247,419
Average 1931-1935 ..	–	–	17,155	[a]	[a]	[a]	[a]	[a]	[a]

[a] No average has been calculated because the method of estimating yields from 1933 to 1935 is not comparable to that employed in 1931 and 1932. The yield and production of 1933, 1934, and 1935 are based on the condition of the growing wheat.

For 1931 to 1934, *Agriculture of the Soviet Union;* for 1935, *Sotsialisticheskoe Stroiteljstvo S.S.S.R.*, Statistical Yearbook, Moscow, 1936.

Sugar beets - The Ukraine, although not ideally adapted to the production of sugar beets, is by far the most important source of sugar in the Soviet Union. In 1935, the Ukraine harvested 2,095,000 acres of sugar beets, which was 69.2 percent of the 3,027,000 acres harvested in the Union as a whole (table 5). Yields in the Ukraine were somewhat better than in other parts of the Soviet Union, which raised the Republic's production of beets to 71.1 percent of the Union's total of 17,865,000 short tons.

Cotton[43] - In the struggle for self-sufficiency in fiber supplies, the cultivation of cotton has been extended to the northern shores of the Black and Caspian Seas. Although soil conditions are not ideal and climatic conditions are marginal, some 387,000 acres of cotton were planted in 1935 in localities where the most nearly suitable conditions could be found. This area in the Ukraine represented 8 percent of the Union's total cotton acreage. In recent years the acreage in the Ukraine has been increased. The 1938 plan for collective farms called for 547,000 acres in the Ukraine, or 11 percent of Russia's total planned acreage for collective farms. This figure probably represents very nearly the limit of possible expansion.

Livestock - The Ukraine plays no outstanding role in the economy of the Soviet Union as regards cattle or sheep; but, as a producer of feed grains, barley and corn, the Republic has been able to assume a fairly important position in swine production. The relation of the livestock numbers of the Ukraine to those of the Soviet Union in 1935 is shown in the table below.

Table 7. Livestock numbers in the Ukraine and the Soviet Union, January 1, 1935.

KIND	UKRAINE	SOVIET UNION	PERCENTAGE OF TOTAL IN UKRAINE
	Thousands	*Thousands*	*Percent*
Horses	2,414.4	14,938.6	16.2
Cattle	4,960.1	38,411.1	12.8
Sheep and goats	1,766.2	40,761.0	4.3
Swine	3,792.5	17,088.8	22.2

Numbers of Livestock in the U.S.S.R. on January 1, 1935.

As one might infer from the foregoing outline of the socialization of the means of production in the Ukraine, most of the horses (75.5 percent) were found in the collective herds of collective farms at the beginning of 1935 (see table 8). On the other hand, most of the cattle (48.8 percent) and a large part of the swine (41.2 percent) were the private property of peasant members of collective farms. As indicated in the following table, peasant members of collective farms owned as their own property 2,422,400 head of cattle on January 1, 1935. By July 1, 1936, the number of cattle owned by the 3,733,200 peasant households on collective farms in the Ukraine had increased to 4,299,300 head, or an average of more than one per family. Peasant swine increased from 1,563,500 on January 1, 1935, to 3.236.300 head by June 1, 1936.[44]

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[43] See "Cotton Growing in the Soviet Union," by Louis G. Michael, published in *Foreign Agriculture*, August 1938.

[44] The January 1 figure is winter carry-over, whereas the June 1 figure includes pigs.

Table 8. Livestock in the Ukraine, by categories of ownership, January 1, 1935

OWNERSHIP	HORSES	CATTLE	SHEEP	GOATS	SWINE
Collective Farms –	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*
Collective herds	1,821.9	1,188.0	882.4	2.5	810.2
Private property of peasants ...	8.8	2,422.4	203.2	79.2	1,563.5
State farms, etc.	372.2	655.9	472.2	2.8	826.5
Individual farmers	157.7	204.1	20.2	12.9	142.9
City workers' private property	53.8	489.7	6.1	84.7	449.4
Total	2,414.4	4,960.1	1,584.1	182.1	3,792.5

Numbers of Livestock in the U.S.S.R. on January 1, 1935.

There is no commercial animal industry in the Ukraine of significance to the Union as a whole. The milk, butter, and meat produced are almost exclusively for local consumption. The quality of the meat is poor and the quantity inadequate to the normal needs of a healthy nation.

General Significance

The significance of the Ukraine to the economy of the Soviet Union is limited largely to the supplies of grain and sugar that can be shipped to the north or exported to Western Europe. The Ukraine has often been referred to as the "Granary of the Soviet Union," and indeed the Republic is the most important wheat region in Russia, having harvested an average of one-fourth of the Soviet's total wheat production during the years 1931 to 1935. Not only as regards acreage but also as concerns production the relative participation of the Ukraine in the totals for all grains in Russia has shown a downward trend in recent years. This trend is due not so much to decreases in the Ukraine as to important increases in other parts of the Soviet Union.

Strenuous efforts are being made to extend the production belt of Russia northward and to bring previously unexploited areas under cultivation. The agricultural technique employed in the Soviet Union can be greatly improved through scientific experimentation, education, and extension of approved theory to practical application. The farm management of collective and state farms can be made more effective. It can therefore be expected that during the coming years production will be increased, not only in the Ukraine, but in other parts of the Soviet Union as well. Following expansion in other parts of the Union, the Ukraine may lose a certain part of its prestige as the "Granary of Russia," but it will always be an important, if not the most important, source of the Soviet Union's grain supply.

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POLISH FIBER-SUPPLY POLICY

. . . . By Harry L. Franklin*

United States cotton accounts for the bulk of the Polish textile industry's requirements of this commodity. The United States share in Poland's total raw-cotton imports was approximately 81 percent during the 10-year period 1926-1935, and ranged from 200,600 to 280,000 bales annually. But since 1935, the American share has been substantially lower, owing chiefly to Poland's trend toward bilateral balancing of trade through compensation (barter) and clearing arrangements, which in turn was occasioned by increasing shortage of foreign exchange in relation to general and military needs. Encouraged by the German and Italian use of synthetic fibers, Poland plans to increase progressively the use of synthetic (and domestic substitute) fibers until they account for at least 30 percent of the Polish textile industry's total raw-material requirements within the next 2 or 3 years. This, together with other developments discussed herein, has an important bearing on the future Polish demand for United States raw cotton.

Poland imports 100 percent of its raw cotton and from 80 to 90 percent of its wool requirements. In order to reduce the amount of foreign exchange necessary to pay for these imports of fibers, the Polish Government is seeking to expand progressively the use of substitute domestic fibers by the Polish textile industry, whereby the amount of cotton and wool imports may be correspondingly curtailed. Poland possesses substantial domestic supplies of flax fiber, hemp, cellulose, and casein, which may be processed into substitutes for a portion of the customarily imported quantities of cotton and wool.

The increasing use of substitute fibers of domestic origin by the Polish textile industry, together with proposed policies and plans in this regard, is discussed in a comprehensive article published in the semiofficial economic weekly *Polska Gospodarcza* of December 24, 1938. A previous issue (November 26, 1938) of the same periodical contained an informative article on the use of *cotonina* (one of the leading substitute domestic fibers) in Poland (and in Italy). The present analysis of Polish plans and policy relating to fiber supply is based largely on the two articles mentioned.

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SUBSTITUTE DOMESTIC FIBERS - POLICY AND PLANS

Situation in the Polish Cotton-Textile Industry

Cotonina, as used in Poland, is processed from hemp and flax fibers. It is understood that the processing consists of cutting and preparing the flax and hemp fibers to approach in physical characteristics raw-cotton fiber. Experiments are now being carried on in processing them for use in regular cotton spindles in order to avoid the purchase and installation of special machinery and to facilitate thereby more extensive use of *cotonina*. Cellulose textile fiber (part of which is known as *textra*) is at present the leading domestic fiber substitute for raw cotton in Poland, followed by *cotonina*. Production of *cotonina* in Poland during 1938 amounted to about 1,102 short tons, or 50 percent less than the anticipated output, while artificial cut-fiber (cellulose) production was only slightly below the planned amount of 4,630 short tons.

For 1939, the consumption of *cotonina* has been fixed at 3,858 tons and cellulose fiber at 6,614 tons, or a total of 10,472 tons of domestic substitute fibers to be utilized in the Polish cotton-textile industry during 1939. This represents 10.7 percent of the total raw-material requirements of the Polish cotton-spinning industry during 1939 (set at 97,884 tons), and about 12 percent in relation to raw cotton only. The Government estimates that this will result in a saving of around 12 million zlote (about $2,256,000) in foreign exchange, which otherwise would be required for raw-cotton imports.

In order to encourage the utilization of domestic substitute fibers, the Polish cotton-textile industry will be given a premium of 1 zloty (18.8 cents) in cash and an additional quota allotment of 1 kilogram (2.2 pounds) of raw cotton for each kilogram of *cotonina* used during 1939. Cotton-spinning plants that fail to use *cotonina* will have their quota of raw cotton reduced. In the case of domestic cellulose textile fiber, the premium has been reduced to 0.25 zloty per kilogram (2.13 cents per pound) for 1939, because of increased production and reduced prices of cellulose fiber; and the compulsion to utilize it in order to obtain a full quota of raw cotton has been retained (as in 1938).

Situation in the Wool-Textile Industry

The Polish wool-textile industry's consumption of domestic substitute fibers until 1939 was relatively unimportant. The total requirements of the carding branch of the industry (based on 1938 data) are approximately 24,360 tons of wool, unwashed equivalent; and of this amount, the equivalent of 2,200 tons will be supplied in 1939 by domestic cellulose and casein (*lanital*) fibers. In the coarse-woolen industry, whose total annual requirements are around 7,716 tons of wool, unwashed basis, some 3,300 tons will be supplied by domestic substitute fibers (cellulose and casein).

Including 1,320 tons of domestic wool used primarily in the coarse-woolen branch, it is estimated that domestic fibers (including substitute fibers) will account for around 10 percent of the Polish woolen industry's total raw-material requirements and will represent a saving in foreign exchange of some 11 million zlote (about $2,068,000), which otherwise would be spent for wool imports.

Position of American Cotton

The Polish Government plans, it is reported, to increase progressively the use of domestic substitute fibers during the next 2 or 3 years until they account for at least 30 percent of the total raw-material requirements of the Polish cotton- and wool-textile industries. This may work to the disadvantage of American raw cotton, which occupies a leading position in the Polish cotton-textile industry.

The factors tending to militate against the position of United States cotton in the Polish market may be summarized as follows: (1) Poland's increasing difficulty in obtaining sufficient foreign exchange for both general and military needs; (2) encouragement by the Polish Government of greater use of synthetic (and domestic substitute) fibers through the use of subsidies and preferential raw-material allocations; and (3) provisions relating to raw cotton in the recent Polish-Argentine and Polish-Soviet Union trade agreements. Another factor may also militate against the future position of the United States in the Polish market for raw cotton; namely, the Polish proposed plan to acquire 247,000 acres of land in Brazil suitable for cotton production. On the other hand, the recent credit guaranty by the United States Export-Import Bank for Polish purchases of American cotton, discussed later herein, may offset the unfavorable factors just mentioned.

ALTERNATIVE SUPPLY SOURCES FOR RAW COTTON

Argentina

The Argentine authorities are said to be anxious to increase cotton shipments to Poland, while the Polish authorities are not averse to diversifying raw-material sources where possible on a compensation or balanced-trade basis. With regard to the Polish-Argentine trade agreement, which became effective February 11, 1939, it is understood that there is an appendix to the agreement containing provisions for increasing Polish imports of Argentine raw cotton.

It appears, however, that there has never been any large demand in Polish textile circles for Argentine cotton, which is said to be regarded as of fairly low quality in the textile center of Lodz. Imports from Argentina so far have been very small; but, inasmuch as the Polish Government may insist that the textile industry use larger quantities of Argentine cotton than heretofore, imports thereof may increase substantially in the next few years.

Soviet Russia

Of far greater importance than the agreement just discussed in expanding Poland's raw-cotton imports from other than the customary chief sources is the Polish-Soviet agreement signed on February 19, 1939. According to the official announcement, the Soviet Union, among other things, is to export around 92,000 bales of raw cotton to Poland valued at some 26 million zlote ($4,888,000). In return therefor, Poland is to export to the Soviet Union cotton textiles (in the form of low-grade cloth and clothing) to the value of 15 million zlote ($2,820,000), thus leaving Poland a substantial surplus of Soviet raw cotton above that required for working up into the stipulated cotton-textile exports.

In connection with the anticipated surplus of Soviet cotton remaining for Polish needs after manufacture of the stipulated textiles for Soviet account, the view is reported to be held in some Polish circles that such disposable surplus will not be large and that the tendency rather will be for this trade of raw cotton for textile products to balance at around 20 million zlote ($3,760,000) rather than to maintain a ratio of 26 to 15 million zlote ($4,888,000 to $2,820,000). In support of this view, it is pointed out that the Soviet Union does not have a surplus of fiber to export and that the need for foreign exchange is not so compelling in that country as to lead it to sacrifice that necessary commodity. The Polish cotton-textile industry for the greater part has been tooled and accustomed to work American fiber and in the past has hesitated to make extensive use of Soviet and other lower-quality fibers. But the working up of some 92,000 bales of Soviet cotton annually would tend to reduce or remove this aversion on the part of the textile industry and might encourage such mills voluntarily and permanently to use lower-quality fibers from sources competing with the United States.

In referring to the reciprocal provisions involved in the raw-cotton-textile-manufactures arrangement, the official Polish analysis of the recent Polish-Soviet agreement concluded by stressing the potential effects on American cotton exports to Poland, as follows (in translation):

> *"As far as the Polish side is concerned, the newly concluded agreement is also important because we are transferring part of our cotton imports, on which we spend about 200 million zlote ($37,600,000) per annum, from America to Europe, and this, besides, within the limits of controlled (balanced) trade."*

Brazil

As a source of raw-cotton supply, Brazil was relatively unimportant in the Polish import trade until 1936, when Polish takings of Brazilian cotton rose to 12,907 bales, compared with 2,359 bales in 1934. In 1937, imports of Brazilian cotton into Poland increased to 30,756 bales, but receded to 19,105 bales in 1938, according to preliminary trade returns.

A comprehensive discussion of the proposed project by the Lodz textile industry to establish a 99,000-acre cotton plantation in Brazil as a source of cotton supply was contained in an article in the August 15, 1937, issue of the leading journal of the Polish textile industry.[1] (Lately the figure of 247,000 acres has been mentioned in connection with the proposed project.) While Polish interest in this proposal has apparently been maintained up to the present time, nothing of a definite nature in that regard has thus far been made public.

Imports of Cotton

Poland's imports of raw cotton in recent years from the sources discussed above are shown in the following tabulation:

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[1] *Gazeta Przemyslu i Handlu Wlokienniczego* (The Textile Commercial and Industrial Gazette)

Table 1. Polish imports of raw cotton for selected years

COUNTRY	1929	1936	1937	1938	PERCENTAGE OF TOTAL, 1938
	Bales	Bales	Bales	Bales	Percent
United States ..	229,141	218,003	179,356	217,970	63
Brazil	-	12,907	30,756	19,105	5
Soviet Union ...	-	-	2,454	4,231	1
Argentina	-	1,305	1,504	-	-
Others	49,738	93,967	119,645	106,981	31
Total	278,879	326,182	333,715	348,290	100

It may be noted that no imports of raw cotton into Poland from Argentina, Brazil, or the Soviet Union were separately recorded in 1929, none from Argentina in 1938, and none from the Soviet Union in 1936. While the amount of American cotton imported in 1938 was only moderately below the figure for 1929, the decline in proportionate share was much greater: namely to 63 percent of Poland's total cotton imports compared with 82 percent in 1929. It remains to be seen whether Poland's raw-cotton imports from Brazil, Argentina, and the Soviet Union will supply more than a modest proportion of that country's total raw-cotton requirements during the next few years.

The United States is the outstanding source of supply for Poland's raw-cotton requirements. During the 10-year period 1926-1935, United States cotton accounted for approximately 81 percent of Poland's raw-cotton imports and ranged from 200,000 to 280,000 bales per year. Other important suppliers have been British India and Egypt, and Brazil to a less extent since 1936. The development of Poland's raw-cotton imports from the United States and other important sources since 1922, together with percentages of the total for the United States, is shown in table 2.

The decline in the share of the total represented by United States cotton since 1933, namely, from 88 percent in 1933 to 63 percent in 1938 (54 percent in 1937), has been due primarily to Poland's trend toward bilateral balancing through compensation (barter) and clearing arrangements and the extension of what amounts to preferential treatment to countries with which Poland has a "favorable" balance of trade. Poland's total imports from the United States for a number of years have greatly exceeded the value of exports to this country, but in recent years the customary heavy import surplus has been substantially reduced through the Polish trade policy just mentioned.

OUTLOOK FOR AMERICAN COTTON

The outstanding commercial-policy factor favoring Polish purchases of American cotton is the credit granted in February 1939 in the amount of $6,000,000 by the Export-Import Bank of Washington for the benefit of the National Economic Bank of Poland to be utilized for the purchase of United States raw cotton and copper. It is understood that the bulk of the credit, say around three-fourths, will be utilized for raw-cotton purchases. Moreover, another brighter aspect of the picture is to be found in the steadily growing domestic demand for cotton in Poland.

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Table 2. Imports of cotton into Poland (including Danzig), by countries, 1922-1938
(Bales of 478 pounds net)

YEAR	UNITED STATES		BRITISH INDIA	EGYPT	BRAZIL	OTHER COUNTRIES	TOTAL
	QUANTITY	PERCENTAGE OF TOTAL					
	Bales	*Percent*	*Bales*	*Bales*	*Bales*	*Bales*	*Bales*
1922 ...	226,128	85	[a]	[a]	1,373	37,283	264,784
1923 ...	193,843	81	[a]	[a]	643	45,144	239,630
1924 ...	125,809	68	7,786	3,912	[a]	48,837	186,344
1925 ...	160,603	68	16,523	4,220	[a]	53,527	234,873
1926 ...	209,905	79	27,379	8,345	[a]	21,326	266,955
1927 ...	279,974	82	33,453	9,784	[a]	16,546	339,757
1928 ...	267,413	82	32,598	9,715	[a]	18,148	327,874
1929 ...	229,141	82	22,534	12,980	[a]	14,224	278,879
1930 ...	206,530	80	27,433	10,332	[a]	12,961	257,256
1931 ...	211,752	86	14,427	13,667	[a]	6,934	246,780
1932 ...	200,557	88	6,009	18,160	[a]	3,675	228,401
1933 ...	230,775	86	12,361	21,284	[a]	5,036	269,456
1934 ...	227,479	75	22,797	39,296	1,144	13,682	304,398
1935 ...	225,697	74	29,967	34,612	2,359	10,563	303,198
1936 ...	218,003	67	38,586	36,740	12,907	19,946	326,182
1937 ...	179,356	54	44,860	34,283	30,756	44,460	333,715
1938 ...	217,970	63	30,314	41,803	19,105	39,098	348,290

Compiled from *Annuaire du Commerce Exterieur de la Republique Polonaise*, 1922 to 1925, and *Annuaire du Commerce Exterieur de la Republique Polonaise et de la Ville Libre de Danzig*, beginning with 1926

[a] If any, included in "other countries."

In Polish textile circles the view is reported to be held that it will be necessary for Poland to increase its raw-cotton imports by from 46,000 to 55,000 bales during the present cotton year if total demand is to be met, notwithstanding the increasing use of domestic substitute fibers. Consequently, United States cotton may retain or even improve its present position in the Polish market, notwithstanding the potentially unfavorable factors outlined above. Incidentally, the managing director of the Gydnia-American line announced recently in New York that two new Polish motor ships, the *Lodz* and *Bielsko* are being built especially for cotton trade between United States Gulf ports and Gydnia and will be put into service this autumn.

In the final analysis, however, the United States will have to import more from Poland if it expects Poland to maintain purchases of American cotton. So much of Poland's foreign trade is already carried on under clearing and barter arrangements, which provide for bilateral balancing with each country, that Poland is unable to obtain an excess of foreign exchange with which to purchase American cotton.

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ROYAL HUNGARIAN MUSEUM OF AGRICULTURE*. . .

> *On the edge of a small lake in Budapest stands a huge medieval castle with numerous towers and wings, each depicting an architectural style typical of some period of Hungary's history. Inside these castle walls is housed one of the world's unique scientific collections. This is the Royal Hungarian Museum of Agriculture, the first agricultural museum to be formed in Europe, where it is still the largest, the most complete, and probably the most interesting institution of its kind.*

The Royal Hungarian Museum was built in 1897, not to serve wholly as a storehouse of relics relating to earlier, historic agriculture, but to accomplish the vital purpose of presenting an ever-changing, up-to-date view of agriculture, embracing forestry, horticulture, animal husbandry, fish culture, game preservation, agricultural industries, etc. To accomplish this purpose, the museum is constantly being transformed, with new and better exhibits being added, new plans being proposed, and older material being renewed. As a result of this policy, the museum remains in close contact with life and public interest, as witnessed in the attendance figures, which reach far into the thousands of visitors each year; for the purpose of this institution is to inform, encourage, and inspire those who view its hundreds of agricultural exhibits.

Recently increasing numbers of officials from other countries have come to Budapest to visit the Royal Hungarian Museum of Agriculture. Among these visitors have been officials from various continental European countries, from England, from the United States, and from two South American nations. Not many years ago, the late King Fuad I of Egypt visited the museum and was so impressed by the presentation of its contents that, as a result, the Egyptian Ministry of Agriculture in 1930 decided to create at Cairo an agricultural museum, costing a little under $1,000,000. The Director of the Hungarian Agricultural Museum was invited to Egypt and undertook the organization of the Fuad I Agricultural Museum, which was opened at Cairo in February 1938. Recently the English press, particularly *The London Times*, has shown a very marked interest in the formation of an English or British Commonwealth agricultural museum. Such an institution, comprising the agriculture of the entire British Empire, would certainly command widespread interest.

The idea of forming a permanent agricultural museum in Hungary arose out of the Hungarian Millenium celebration in Budapest in 1896. It was decided that the valuable collection of agricultural material gathered for this celebration should not be allowed to return to various sections of the country at the conclusion of the celebration but should remain to form the nucleus of a complete agricultural museum. The Hungarian legislature voted the funds necessary to rebuild some of the temporary exhibition buildings and to inaugurate the task of preparing a museum that would reflect the agricultural life of the country. Today this museum contains more than 40,000 agricultural display objects and a special library comprising 36,000 volumes.

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* By James Parker Wilson, formerly technical assistant, office of the Agricultural Attache, Belgrade, Yugoslavia.

Entering the renaissance building of the museum, the visitor passes from the main hall to the right, where the meteorological reports and general climatic and rainfall charts and maps meet the eye. A revolving, disciform picture fastened to the wall shows the amount of sunshine enjoyed by villages situated in various parts of Hungary. In the agrogeology section, the Hungarian soil maps, profiles of typical soils, and soil samples are displayed. The soil science, soil improvement, and fertilizer exhibits are in a little round room just beyond. Here are excellent exhibits presenting the physical, chemical, and biological properties of the principal types of soil found in the country, together with exhibits demonstrating the best methods of utilizing recent developments in soil science.

The next section deals with irrigation, the regulation of water, and its utilization in agriculture. It presents exhibits of flood control and surface drainage, the regulation of water courses, and the organization of the country's hydraulic-power resources. In the next two rooms are the pasturage and grass-growing exhibits with their life-sized models of the herdsmen's hovels, typical pasture lands, implements required in carrying out the work connected with scientific pasturage and meadow husbandry, and implements required in the life of the herdsman, past and present. One room contains the graphically presented exhibits of the various fodder plants, with numerous pictures and alcohol-preserved species. The section on root and leaf plants contains exhibits of the turnip, the potato, the sugar beet, and other root plants. Particularly interesting are the exhibits of tobacco, along with model tobacco sheds and various types of other buildings used in the tobacco industry of Hungary. Colored photographs present the various processes involved in growing, preparing, and marketing tobacco.

Of increasing importance are the next two exhibit sections, which are devoted to industrial and medicinal plants, a growing agricultural industry in Hungary, and to paprika, for which Hungary has long been famous. The paprika exhibit is the finest of its kind in the world. Here the whole history of the Hungarian paprika-growing industry is presented in photographs, paintings, diagrams, and the actual articles, from the cultivation as plants through the processes of harvesting, drying, stringing, preparing, grinding into powder, receiving the Government's mark of approval (cocketing) and through every phase of packing down to the actual export article. Nearby are models of paprika farms, mills, laboratories, and other buildings connected with the industry.

The visitor leaves the rich red color and the pungent odor of the paprika exhibits for the section dealing with cereals and plant improvements. Here, again, the opportunity is afforded of seeing excellent exhibits of one of Hungary's vital agricultural industries - cereal growing. On the right begin the exhibits of corn with maps and diagrams, together with colored illustrations, presenting and depicting the role of maize in the Hungarian national economy. On the next wall are the barley exhibits, and, appropriately, the beer industry is extensively described on the other side of the room. Like the paprika exhibit, the exhibits showing the history and development of the present-day beer industry are a high point in a visit to the museum.

Here are diagrams presenting an ancient Egyptian brewery, a Caucasian (Osliak) brewery, a brewery of 1050, and a present-day brewery. On the walls surrounding are charts of exports of malt, a statistical map illustrating Hungary's beer industry in 1913 and at the present time, as well as numerous pictures. Following these are exhibits of rye, oats, and wheat.

The revolutionary steps forward that have followed the invention of cereal machinery, such as the combines, harvesters, and threshing machines, are presented by models. For example, in a case containing the model of a modern threshing machine are water-color paintings on either side, showing the methods of threshing prior to the invention of the threshing machine - that is, threshing with a flail and threshing by horse power. The section of the museum devoted to wheat and wheat flour is splendidly laid out. There is a fine collection of miniatures - for instance, of an ancient stone roller, of a dry mill (treadmill), of a water mill, of the old-fashioned windmills, down to an old Hungarian flour mill more than a century old. The division of this exhibit devoted to wheat breeding, wheat samples, and the work of the experimental station is intensely interesting.

Somewhat different are the next exhibits. These deal with plant protection systematically, through illustrations and preserved specimens, presenting the pests and diseases injurious to fodder plants, meadows and pastures, sugar beets, potatoes and industrial plants, leguminous plants, and cereals. The division dealing with plant hygiene contains two large cases of specimens of all fungicides and insecticides officially approved. In the next section are the individual exhibits of various agricultural organizations and experimental stations in Hungary. These include displays - always with a description of the organization in three languages - which are prepared by such representative agricultural bodies as the Hungarian Agricultural Machinery Testing Station, the Hungarian Agrimonial Institute, and the Royal Hungarian Institute of Geology.

Following these displays are the models of agricultural implements. This exhibit begins with a series of plows, showing the development of the plow from the earliest times to the present day. Opposite these quaint wooden and metal instruments are the agricultural implements of all kinds in use in modern times. Even steam engines and large tractors are in this exhibit. The section on agricultural buildings and on the conditions of farm labor is not adequate. From a historical standpoint, however, the models of village peasant homes, farm buildings, and the like are quite interesting. Beyond this exhibit are maps and charts presenting statistical data which have not been broken down into exhibits. Maps in this section show the density of the population of Hungary and its distribution by occupations. Three tables show the types of land in Hungary: and there are maps and diagrams to show the organization and functions of the Agrarian Intelligence Service, the Agricultural Inspectors' Service, and numerous credit and cooperative organizations.

In the crystal hall an idea is given of the development and scope of Hungary's export trade in agricultural products. The Royal Hungarian Institute for Foreign Trade maintains an excellent exhibit, emphasizing high standards of quality and the best methods of handling, packing, and marketing agricultural produce.

The next major section of the museum is devoted to Agricultural Education. Here the visitor is impressed by the large number of agricultural vocational schools. Particularly interesting and unusual are the charts showing the distribution of People's Libraries and institutions offering special courses and training in agriculture.

Hungary has long been noted for its fine wines - the white and red wines of the Tokay district particularly - and, therefore, the section of the museum dedicated to viticulture is quite elaborate. Colored maps and charts show the grape-growing sections of the country, and there are fine models of implements and machines used by the wine-growers, a model wine cellar, a model fermenting house, and a press house with hydraulic press and special filters. There are many pictures and numerous preserved specimens of plants. One case contains all of the instruments used in the laboratories to test the vines, wines, grapes, and raisins. Another case contains a collection of soils and fertilizers most suitable for grape culture, and still another contains plant and animal pests injurious to the vine.

The section devoted to horticulture is filled with superb reproductions of countless varieties of fruits, nuts, vegetables, and ornamental plants. All of the most modern plans and techniques of gardening and orcharding are presented; and great attention is given to cultivation, pruning, picking, packing, and marketing of horticultural products. Much emphasis is placed upon the ways of combating pests and diseases. Connected with the horticultural section is a division of preserves and fruit spirits. Most noted of these, at present, are apricot jam and apricot brandy. The displays in the apiculture section are unusually complete; and the techniques of beekeeping, the models, and the photographs are excellent. Following is the sericulture section; and the visitor will be amazed at the extent and importance of the silk industry in Hungary.

The section dealing with the breeding of poultry, pigeons, and rabbits is not typically Hungarian, with its Rhode Island Red, Plymouth Rock, and White Leghorn chickens, its turkeys, ducks, and pigeons, and its stuffed rabbits; but the section on hog breeding again coincides with a major Hungarian industry. Here are seen the huge, hairy Mangolica hogs along with figures of the Yorkshire and Berkshire boars and sows. There are many books and photographs dealing with the hog industry, as well as model hog farms and a miniature farrowing stable from the domain of a large landowner in Hungary. The breeding and pedigree charts are exceptionally well executed. The Hungarian is noted in history as a fine horseman, and the section on horse breeding reflects the nobility of the horse in Hungarian eyes. The great display of medals from international exhibitions impresses the visitor with the importance of horse breeding in Hungary, in the past as well as at present. The subsequent sections deal with veterinary administration, the breeding of horned cattle and sheep, and dairying.

The showcases containing exhibits of primitive occupations contain model ranches, country residences of the nobles, and peasant dwellings. The herdsman's musical instruments are there - crude bagpipes, flutes, and pipes - along with many other quaint and curious personal and household articles and instruments. The rest of the museum is not strictly agricultural. There are forestry exhibits, sections on fishing, shooting, and hunting, all in perfect style and gracefully displayed.

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RECENT DEVELOPMENTS

IN

FOREIGN AGRICULTURAL POLICY

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ARGENTINE-BRAZILIAN EXCHANGE AGREEMENT

According to reports from the American commercial attachés at Buenos Aires and Rio de Janeiro, an exchange agreement between Argentina and Brazil was signed in Buenos Aires on April 13. This agreement is to be effective during the course of conversations between the Argentine and Brazilian Governments looking toward the conclusion of a definitive commercial treaty, and, when the treaty is concluded, is to form a part thereof.

Under the terms of the agreement, the Argentine Government assures prior permits at the official rate of exchange to cover imports of merchandise of Brazilian origin, while export drafts arising from the sale of Argentine products to Brazil are to be negotiated in the Argentine official exchange market. The Government of Brazil agrees to assure the payment of imports from Argentina, applying in their liquidation the most favorable conditions established in the Brazilian exchange system. Both Governments obligate themselves to take such measures as may be necessary to prevent disturbing the normal development of Argentine-Brazilian commerce by export bounties or other types of compensation on sales, which are equivalent to artificial price-fixing or which in a general manner impede the free play of supply and demand in prejudice to one country or the other.

To Argentina, the major advantages of the agreement appear to lie in the indirect protection given to Argentina's important market for wheat in Brazil through the provision with respect to bounties and in the assurance of favorable treatment in the liquidation of exchange covering imports of Argentine goods. From the Brazilian standpoint, it is doubtless anticipated that the Argentine assurance of exchange at the more favorable official rate to cover imports from Brazil will stimulate sales of Brazilian products in the Argentine market.

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COLOMBIA TO AID CATTLE INDUSTRY

The establishment of a National Cattle Loan Fund of 5 million pesos (about $2,858,000) from which loans are to be made to farmers for facilitating the breeding and raising of cattle was authorized in Colombia early this year by presidential decree, according to a report received in the Office of Foreign Agricultural Relations from the American Embassy at Bogotá.

The authorized capital is to be guaranteed by the Government, but provision is also made for participation by private financial organizations. The fund has been started by an initial subscription of 1 million pesos ($572,000) by the Government. It will be administered by a Council composed of the board of the Agricultural, Industrial, and Mining Credit Bank and the Minister of Finance.

The Council will have a life of 40 years and will begin operations on July 1, 1939. Its functions are (1) to make mortgage loans for gradual amortization over a period of 20 years; (2) to make and guarantee 5-year loans by chattel mortgages on livestock and livestock products, or on property for use in connection with the exploitation of livestock; and (3) to make duly guaranteed loans, which in the judgment of the Council are necessary for the development and expansion of the cattle-breeding industry.

The Council is also authorized to issue mortgage certificates to the public, which will be acceptable at par in payment of taxes and debts to the Government. Such mortgage certificates may be acquired by banks up to amounts authorized by law. The certificates will be guaranteed by the mortgages held by the Council.

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TAIWAN RAPIDLY ACHIEVING SELF-SUFFICIENCY IN JUTE

Jute-cultivation quotas were allotted in Taiwan in February 1939 through Provincial and prefectural governments for the planting of approximately 60,000 acres, according to a report received in the Office of Foreign Agricultural Relations from Consul Gerald Warner at Taihoku, Taiwan. The allotments were in accordance with the Ten Year Plan for agricultural expansion drawn up last year by the Bureau of Productive Industries of the Taiwan Government.

In 1938, only around 13,000 acres were devoted to jute in Taiwan, and the crop totaled 25 million pounds. One of the objectives of the Taiwan Government for several years has been to reduce the island's dependence on India for raw jute and gunny bags. A plan was announced last fall for the intensive encouragement of jute growing in Taiwan. The plan provides for holding the acreage at the current level for some years and for increased attention in the future to higher yields per acre. It anticipates supplying all the jute requirements of the Japanese Empire by 1948.

It is expected that the 1939 crop will range between 65 and 70 million pounds. This would supply sufficient jute for the manufacture of 10 million bags for packing sugar and 12 million bags for packing rice, the two principal export crops of Taiwan. In 1938, some 9 million bags were used for the export movement of sugar and 11 million for the export movement of rice. In addition, some 8 million bags were required to handle the proportion of the rice crop that did not move in export channels.

Around 9 million new bags and 13 million old bags were imported by Taiwan in 1938, mainly from India and Japan. In addition, the imports of jute, almost all from India, amounted to 7 million pounds. The local production of new gunny bags was estimated at about 6 million. In order to be entirely self-sufficient, the Taiwan jute-bag-manufacturing capacity will have to be more than doubled, according to the report.

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